Appendix 2 – Pending Claims

1. (Twice Amended) A communication system for passing communication between a plurality of terminal devices, including telephones and computers, and a plurality of information services, including a telephone network and a data network, comprising:

a twisted pair wiring network coupled to the terminal devices including a plurality of separate twisted pair wiring networks, each separate twisted pair wiring network being for passing voice signals in a telephone voice frequency band between the telephone network and the one or more telephones coupled to said separate twisted pair wiring network; and

circuitry coupled to each of the separate twisted pair wiring networks for combining telephone and data signals including

a first data hub coupled to the data network and including a plurality of data ports each associated with a different one of the separate twisted pair wiring networks, wherein the first data hub includes circuitry for inhibiting transmission of data received from the data network and addressed to a computer coupled to one of the data ports from being transmitted on other of the data ports, and

for each of the data ports, circuitry coupled to the telephone network and to said data port, coupled to the separate twisted pair wiring network associated with said data port, and configured to combine on said separate twisted pair wiring network (a) telephone voice signals in the telephone voice frequency band passing between the telephone network and the one or more telephones on said separate network, and (b) high frequency signals in a high band of frequencies higher than those of the telephone voice frequency band passing information between said data port and one or more of the computers coupled to said separate twisted pair wiring network,

wherein each separate twisted pair wiring network includes a two-conductor network and the circuitry coupled to the telephone network and to said data port further includes a first media adapter including circuitry for communicating with the first data hub over more than two conductors and for communicating with the one or more computers on said separate twisted pair wiring network over the two-conductor network.

19. The system of claim 18 wherein the first media adapter is configured to communicate with the first data hub using Ethernet signals over four conductors.

20. The system of claim 19 further comprising a second media adapter coupled to the two-conductor network and to one of the computers, said second media adapter including circuitry for communicating with said computer using Ethernet signals over four conductors and for communicating with the first media adapter over the two-conductor network.

21. The system of claim 19 wherein the first media adapter includes circuitry coupled to the two-conductor network for transmitting a signal in a first frequency band to indicate that it is transmitting data onto the two-conductor network and for detecting a signal in a second frequency band indicative of another device transmitting data onto the two-conductor network, whereby the signals in the first and second frequency band provide information for detecting data collisions on the two-conductor network.

22. The system of claim 21 wherein the signal in the first frequency band is a tone at a first frequency above the telephone voice frequency band, and the signal in the second frequency band is a tone at a second frequency different from the first frequency and above the telephone voice frequency band.

23. The system of claim 1 wherein the circuitry for combining telephone and data signals includes

a wiring block having a plurality of corresponding pairs of contacts, wherein for each pair, one contact is coupled to the telephone network, and the other contact is coupled to the separate twisted pair wiring network, said wiring block being configured to accept a connector between the pairs of contacts such that in the absence of an inserted connector, each pair of contacts are directly electrically coupled, and

said circuitry further includes a connector inserted between the pairs of contacts, wherein the connector includes a plurality of low-pass filters, each associated with a different of the pairs of contact and providing signal path in the telephone voice frequency band between the contacts of said pair of contact.

24. The system of claim 23 wherein the connector is coupled to first data hub and includes circuitry for providing a signal path in the high band of frequencies between the first data hub and the separate twisted pair wiring network and for providing a signal path in the telephone voice frequency band between the telephone exchange and the separate telephone wiring network.

25. The system of claim 24 wherein the wiring block includes a telephone 110 wiring block, and the connector forms a cover over a face of the wiring block.

26. The system of claim 25 wherein the connector includes an RJ-21 jack for attaching a cable that couples the connector to the first data hub.

27. The system of claim 1 wherein the circuitry for combining telephone and data signals includes a plurality of low-pass filters for blocking signals in the high band of frequencies from passing to the telephone network.

28. The system of claim 27 wherein the plurality of low-pass filters include a plurality of passive modules each attached directly to a different wire passing between to the telephone network, wherein each of said passive modules is configured to break the conductive path of said wire and to provide an alternative low-pass filter path when it is attached.

29. The system of claim 1 wherein the twisted pair wiring network includes a plurality of disjoint groups of separate twisted pair wiring networks and the circuitry for combining telephone and voice signals is coupled to the separate twisted pair wiring networks of one of the groups, and the system further comprises:

a main interface coupled to the telephone network and to the data network; and

a main wiring network coupling the main interface and the circuitry for combining telephone and data signals;

wherein the main interface includes a second data hub coupled to the data network, said second hub including a plurality of data ports each associated with a different one of said disjoint groups, one of said data ports being coupled through the main wiring network to the first data hub and providing a communication path between the first data hub and the data network.

30. The system of claim 1 wherein at least one of the separate twisted pair wiring networks includes a plurality of cables forming branching paths, and one or more splits at which three or more of the branching paths are joined.

31. The system of claim 30 wherein the one or more splits includes a first split including a low pass filter for blocking signals in the high band of frequencies from passing to one of the branching paths.

32. The system of claim 30 wherein the one or more splits includes a second split including a junction that matches the impedance in the high frequency band of the branching paths joined at said junction.

33. (Amended). The system of claim 32 wherein the junction includes circuitry for coupling the branching paths in the telephone voice frequency band, including a common low frequency path coupled to at least one of the branching paths through a low-pass filter, and includes circuitry for coupling the branching paths in the high band of frequencies, including a circuitry for matching impedance coupled to at least one of the branching paths through a high-pass filter.

34. The system of claim 33 wherein the common low frequency path is coupled to each of the branching paths through a different low-pass filter, and the circuitry for matching impedance is coupled to each of the branching paths through a different high-pass filter.

35. The system of 1 wherein at least one of the separate twisted pair wiring networks includes a communication adapter including:

a first interface for coupling the communication adapter to a first branch of said twisted pair telephone wiring network, said first branch providing a communication path between the data network and said communication adapter;

a second interface for coupling the communication adapter to a second branch of a twisted pair wiring network;

a low frequency signal path coupling the first interface and the second interface, including a low-pass filter;

a third interface for connecting a computer to the communication adapter;

a high frequency signal path coupling the first interface and the third interface, including a high-pass filter; and

a high-frequency signal path switchably coupling the first interface to the second interface depending on the absence or presence of a connection to the communication adapter at the third interface.

36. The system of claim 35 wherein the communication adapter includes:

a fourth interface for coupling the communication adapter to a third branch of said twisted pair wiring network; and

a low frequency signal path coupling the first interface to the fourth interface.

37. The system of claim 36 wherein the third interface includes a RJ-45 jack.

38. The system of claim 7 wherein the fourth interface includes an RJ-11 jack.

39. (Amended). The system of claim 1 wherein the terminal devices further include television receivers and associated remote control devices coupled to the twisted pair wiring network, and wherein the circuitry for combining telephone and data signals further includes a video source, said video source including a receiver for accepting control information sent from the remote control device over the twisted pair wiring network in the high band of frequencies and a transmitter for providing a television signal to the television receiver over the twisted pair wiring network in the high band of frequencies in response to the control information.

40. The system of claim 39 wherein said video source includes a video selector coupled to a television distribution network.

41. The system of claim 39 wherein said video source includes a server computer coupled to the data network, said server computer being configured to receive control information from the remote control devices, to access video information over the data network responsive to the received control information, and to provide a video signal including the accessed video information for transmission to the television receiver.

42. The system of claim 41 wherein the server computer is configured to access hypertext markup language (HTML) data over the data network and to generate the video signal responsive to the accessed HTML data.

43. A communication system for passing voice and data communication between a plurality of terminal devices, including one or more telephones and one or more computers, and a plurality of information services, including a telephone network and a data network, comprising:

a twisted pair wiring network coupled to the terminal devices for passing telephone voice signals in a telephone voice frequency band between the telephone network and the one or more of the telephones on said twisted pair wiring network; and

circuitry for combining telephone and data signals including

a data interface coupled to the data network and including a data port for passing data to the twisted pair wiring network,

circuitry coupled to the telephone network and to said data interface, coupled to the twisted pair wiring network, and configured to combine on said twisted pair wiring network (a) telephone voice signals in the telephone voice frequency band passing between the telephone network and the one of the telephones on said twisted pair network, and (b) high frequency signals in a high band of frequencies higher that those of the telephone voice frequency band passing information between said data interface and one or more of the computers coupled to said twisted pair wiring network;

wherein the twisted pair wiring network includes a plurality of cables forming branching paths, and one or more splits at which three or more of the branching paths are joined, and the one or more splits includes a first split including a low pass filter for blocking signals in the high band of frequencies from passing to one of the branching paths.

44. The system of claim 43 wherein the one or more splits includes a second split including a junction that matches the impedance in the high frequency band of the branching paths joined at said junction.

45. The system of claim 44 wherein the junction includes circuitry for coupling the branching paths in the telephone voice frequency band, including a common low frequency path coupled to at least one of the branching paths through a low-pass filter, and includes circuitry for coupling the branching paths in the high band of frequencies, including a circuitry for matching impedance coupled to at least one of the branching paths through a high-pass filter.

46. The system of 43 wherein the twisted pair wiring networks includes a communication adapter, including:

a first interface for coupling the communication adapter to a first branch of the twisted pair telephone wiring network, said first branch providing a communication path between the data network and said communication adapter;

a second interface for coupling the communication adapter to a second branch of a twisted pair wiring network;

a low frequency signal path coupling the first interface and the second interface, including a low-pass filter;

a third interface for connecting a computer to the communication adapter;

a high frequency signal path coupling the first interface and the third interface, including a high-pass filter; and

a high-frequency signal path switchably coupling the first interface to the second interface depending on the absence or presence of a connection to the communication adapter at the third interface.

47. The system of claim 46 wherein the communication adapter includes:

a fourth interface for coupling the communication adapter to a third branch of said twisted pair wiring network; and

a low frequency signal path coupling the first interface to the fourth interface.

48. A device for connecting to a twisted pair wiring block having a plurality of corresponding pairs of contacts, wherein said wiring block is configured to accept a connector between the pairs of contacts such that in the absence of an inserted connector, each pair of contacts are directly electrically coupled, said device comprising:

a first connector for insertion between the pairs of contacts, including contacts for mating with a first contact and a second contact of each of the pairs of contacts;

a second connector providing a plurality of contacts, each of said contacts corresponding to a different one of the pairs of contacts of the wiring block;

circuitry for providing a signal path in a first band of frequencies between the first contact and the second contact of each of the pairs of contacts of the wiring block;

circuitry for providing a signal path in a second band of frequencies higher than the frequencies of the first band of frequencies between the each of the contacts on the second connector and the first contact of the corresponding pair of contacts on the wiring block.

49. The device of claim 48 wherein the wiring block includes a telephone 110 wiring block, and the device forms a cover over a face of the wiring block.

84 50. (Amended). The device of claim 49 wherein the second connector includes an RJ-21 jack.

51. (NEW). The system of claim 1 wherein the first media adapter is configured to communicate with the first data hub using Ethernet signals over four conductors.

85 52. (NEW). The system of claim 51 further comprising a second media adapter coupled to the two-conductor network and to one of the computers, said second media adapter including circuitry for communicating with said computer using 10 megabit per second Ethernet signals over four conductors and for communicating with the first media adapter over the two-conductor network.

53. (NEW). The system of claim 52 where the first frequency band does not overlap the frequency band used by 10 megabit per second Ethernet signals.

54. (NEW). The system of claim 51 wherein the first media adapter includes circuitry coupled to the two-conductor network for transmitting a signal in a first frequency band to indicate that it is transmitting data onto the two-conductor network, whereby the signals in the first frequency band provide information for detecting data collisions on the two-conductor network.

55. (NEW). The system of claim 54 wherein the first frequency band does not overlap the telephone voice frequency band.

56. (NEW). The system of claim 55 where the first frequency band does not overlap the frequency band used by 10 megabit per second Ethernet signals.

57. (NEW). The system of claim 55 where the first frequency band does not overlap the frequency band used by 100 megabit per second Ethernet signals.

58. (NEW). The system of claim 52 wherein the first frequency band does not overlap the frequency band used by 100 megabit per second Ethernet signals.

59. (NEW). The system of claim 51, wherein:

said first media adapter transmits signals to said first data hub over a first twisted pair cable and receives signals from said first media hub over a second twisted pair cable, and

when operating in a first mode, said first media adapter receives any signals that are present on said two conductor network and transmits them to said first data hub over said first twisted pair cable, and

when operating in a second mode, any signals transmitted from said data hub over said second twisted pair cable are received by said first media adapter and transmitted onto said two conductor network, and

when operating in said first mode, said first media adapter will shift to said second mode if no signals are available for reception on the two-conductor network and said data hub begins to transmit signals over said second twisted pair cable.

60. (NEW). The system of claim 54, wherein:

said first media adapter transmits signals to said first data hub over a first twisted pair cable and receives signals from said first media hub over a second twisted pair cable, and

when operating in a first mode, said first media adapter receives any signals that are present on said two conductor network and transmits them to said first data hub over said first twisted pair cable, and

when operating in a second mode, any signals transmitted from said data hub over said second twisted pair cable are received by said first media adapter and transmitted onto said two conductor network, and

when operating in said first mode, said first media adapter will shift to said second mode if no signals are available for reception on the two-conductor network and said data hub begins to transmit signals over said second twisted pair cable.

61. (NEW). The system of claim 55, wherein:

said first media adapter transmits signals to said first data hub over a first twisted pair cable and receives signals from said first media hub over a second twisted pair cable, and

when operating in a first mode, said first media adapter receives any signals that are present on said two conductor network and transmits them to said first data hub over said first twisted pair cable, and

when operating in a second mode, any signals transmitted from said data hub over said second twisted pair cable are received by said first media adapter and transmitted onto said two conductor network, and

when operating in said first mode, said first media adapter will shift to said second mode if no signals are available for reception on the two-conductor network and said data hub begins to transmit signals over said second twisted pair cable.

62. (NEW). The system of claim 57, wherein:

said first media adapter transmits signals to said first data hub over a first twisted pair cable and receives signals from said first media hub over a second twisted pair cable, and

when operating in a first mode, said first media adapter receives any signals that are present on said two conductor network and transmits them to said first data hub over said first twisted pair cable, and

when operating in a second mode, any signals transmitted from said data hub over said second twisted pair cable are received by said first media adapter and transmitted onto said two conductor network, and

when operating in said first mode, said first media adapter will shift to said second mode if no signals are available for reception on the two-conductor network and said data hub begins to transmit signals over said second twisted pair cable.

63. (NEW). The system of claim 58, wherein:

said first media adapter transmits signals to said first data hub over a first twisted pair cable and receives signals from said first media hub over a second twisted pair cable, and

when operating in a first mode, said first media adapter receives any signals that are present on said two conductor network and transmits them to said first data hub over said first twisted pair cable, and

when operating in a second mode, any signals transmitted from said data hub over said second twisted pair cable are received by said first media adapter and transmitted onto said two conductor network, and

when operating in said first mode, said first media adapter will shift to said second mode if no signals are available for reception on the two-conductor network and said data hub begins to transmit signals over said second twisted pair cable.

64. (NEW). A junction for directing signals that flow along three or more conductive paths that connect to said junction, wherein

each conductive path consists of two twisted pair cables, and

signals flow towards said junction along one of the twisted pairs of each conductive path and signals flow away from said junction along the second twisted pair of the same conductive path, and

said junction includes a signal splitter connected to the twisted pair over which signals flow toward the junction and a signal combiner connected to the opposite twisted pair, and

part of the energy of the signals flowing towards each signal splitter is directed towards each of the signal combiners that are connected to different conductive paths, and

most of the signal energy arriving at each signal combiner is directed onto the twisted pair over which signals flow away from that combiner,

all of the signal splitters and signal combiners function without any external power.

65. (NEW). The system of claim 64 wherein each signal splitter directs an equal amount of energy to each of the signal combiners connected to a different conductive path.

66. (NEW). The system of claim 64 wherein the signals flowing to and from the junction are generated by devices that communicate using the half-duplex 10BaseT Ethernet standard.

67. (NEW). The system of claim 66, wherein at least one twisted pair cable on at least two of the conductive paths includes a hi-pass filter for blocking signals below the highest frequency used for ordinary telephone communications from flowing to or from said junction.

68. (NEW). The system of claim 64 wherein the signals flowing to and from the junction are generated by devices that communicate using the half-duplex 100BaseT Ethernet standard.

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69. (NEW). The system of claim 68 wherein at least one twisted pair cable on at least two of the conductive paths includes a hi-pass filter for blocking signals below the highest frequency used for ordinary telephone communications from flowing to or from said junction.

70. (NEW). The system of claim 64, wherein at least one twisted pair cable on at least two of the conductive paths includes a hi-pass filter for blocking signals below the highest frequency used for ordinary telephone communications from flowing to or from said junction.

71. (NEW). The system of claim 70 wherein at least two of said high pass filters is connected between said junction and a point where a branch twisted pair cable which is connected to one of the two twisted pair cables on conductive path, and a low-pass filter is connected in series with each such branch twisted pair cable, wherein said low pass filter is configured to block signals at frequencies above the telephone voice band.

72. (NEW). The system of claim 71 wherein each branch twisted pair connects to a common junction, thereby allowing ordinary telephone signals to flow from any one branch twisted pair onto all of the branch twisted pairs.

73. (NEW). The system of claim 67 wherein at least two of said high pass filters is connected between said junction and a point where a branch twisted pair cable which is connected to one of the two twisted pair cables on conductive path, and a low-pass filter is connected in series with each such branch twisted pair cable, wherein said low pass filter is configured to block signals at frequencies above the telephone voice band.

74. (NEW). The system of claim 73 wherein each branch twisted pair connects to a common junction, thereby allowing ordinary telephone signals to flow from any one branch twisted pair onto all of the branch twisted pairs.

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75. (NEW). The system of claim 69 wherein at least two of said high pass filters is connected between said junction and a point where a branch twisted pair cable which is connected to one of the two twisted pair cables on conductive path, and a low-pass filter is connected in series with each such branch twisted pair cable, wherein said low pass filter is configured to block signals at frequencies above the telephone voice band.

76. (NEW). The system of claim 75 wherein each branch twisted pair connects to a common junction, thereby allowing ordinary telephone signals to flow from any one branch twisted pair onto all of the branch twisted pairs.